



SECTION C –Amendments to drawing figures

Drawings have been found acceptable by the examiner..



SECTION D – Remarks:

Introduction

In response to Office Action mailed 07/21/05, please accept the preceding amendments , and these remarks. These remarks follow the sequence of the office action. Headings are similar so as to index these remarks as closely as possible to the examiner's comments.

Response to Paragraph 1

Section headed *Allowable Subject*

Matter

Paragraphs starting "Claims 10-27" and "Claim 4"

Applicant and Counsel thank the Examiner for allowing Claims 10-27, and for conditionally allowing Claim 4. The condition, making Claim 4 independent, has been met in this response. Formal allowance of Claim 4 is requested.

Assuming allowance of Claim 4, Claims 4 and 10-27 stand allowed.

Section headed Claim Rejections

Paragraphs starting “The following” and “Claims 1-3”

This is an issue of anticipation by Horie et al., US 5,511,142.

Reconsideration is requested.

Horie '142, at Column 10 starting at line 41, indicates that “...The liquid materials ... solidified through an energy irradiation ... include a light setting resin or a thermosetting resin...” Horie '142, at Column 38 starting at line 30, indicates that “...The optical switch and the directional coupler are implemented by use of a thermo-optical effect.” The nine claims of Horie '142 are a good summary of the Horie '142 teaching; Horie '142 teaches and claims an optical waveguide.

The present patent application has no implementation by optical or thermo-optical effect. Horie '142, as best shown in Figures 6a to 6k, and related description at Column 24, starting at line 28, builds up a rib optical waveguide circuit package in a sequence of treated layers.

Horie '142, is pointed out by the Examiner, as prior art which “...teaches (Figs. 67-68) a photonic-electronic multiple layer circuit package having plural optical waveguide intralayers 82 and electronic intralayers 95 formed as

directional couplers/ switching/modulating devices with the electronic intralayers ...in predetermined patterns... to allow for unobstructed propagation or switching of optical signals.” This, however, does not constitute “anticipation,” because Horie ‘142 does not provide for the two modes, electronics and optics, within the logical package. Horie ‘142 provides a rib-type optical waveguide which, while useful as such, does not provide the multi-layer photonic/electronic package (interconnected layers of photonic circuitry and electronic circuitry) of the present invention. All the electronics in Horie ‘142 are there to perform optical switching functions and directional optical gating functions. Horie ‘142 remains in optical mode operationally;

Why does this matter? As pointed out at page 8-10, under heading CHALLENGES FOR FABRICATION OF PHOTONIC-ELECTRONIC CIRCUIT BOARDS, “ ... achievable data rates [of photonic interconnect structures] as well as channel data rates have been limited. There is thus a great motivation to develop a process platform that will

(a) enable the fabrication of novel photonic interconnect structures that can co-exist with conducting electronic layers in a planar, multi-layer, low-profile format, and

(b) demonstrate the feasibility of manufacturing such boards in large areas at high throughput and low cost.”

Paragraph starting at “The following references”

The Examiner cites the following as “pertinent” to the claims presented in this patent application, but does not apply the patents specifically to the claims and gives no particulars other than figure numbers. Accordingly, counsel believes it appropriate merely to summarize the teaching of these reference and to differentiate that teaching from this application, as follows:

Mannschke “728 (Figs. 1-3)

Mannschke “728 discloses a stack with optical waveguides positioned at different heights in the stack, interconnected optically outside the stack.

Mannschke “728 thus differs dramatically from the invention in this patent application, which interconnects internally as well as externally, and has both optical and electronic elements.

Lackritz '968 (Figs. 1-12)

Lackritz '968 relates to an optical structure made using the trick of patterning a photodefinable layer already covered by an upper layer which is transparent, by shining the patterning radiation through the upper layer.

The technique of Lackritz '968 might be considered for manufacturing the invention of this patent application as well as a variety of other products, but it is not the same as the photonic device of this patent application, which has both optical and electronic elements.

Sakata '140 (Figs. 1-25).

Sakata '149 "...relates to optical apparatus such as a photosensor, a semiconductor laser, an optical amplifier in which a wavelength selective photocoupler is used so as to couple two waveguides through a diffraction grating." (Abstract)

Such technique is not necessary or even preferred for making the photonic device contemplated by this patent application.

Summary

Counsel and applicant thank the Examiner for a concise office action, with Claims 10-27 allowed and Claim 4 conditionally allowed.

All other claims (Claims 1-3 and 5-9) were rejected under Section 102 with Horie et al US Patent 5,511,142 applied.

Three other US patents were made of record as pertinent, but not cited as ground for rejection, nor subjected to comment. These patents were differentiated and are not considered anticipatory under Section 102.

Claims 10-27 stand allowed. Claim 4 stands conditionally allowed with conditions met.

Formal Notice of Allowance is requested.

Respectfully,

Kanti Jain, Inventor

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